

Claims

What is claimed is:

1. A touch sensor, comprising:
a substrate having a resistive touch region;
5 a set of electrodes electrically coupled to the touch region; and
a plurality of band segments framing the touch region and having an
intermediate resistivity between the resistivity of the electrodes and the resistivity of
the touch region, wherein the electrodes are disposed between the band segments,
and at least one of the band segments has a linear resistance that varies along its
10 length, each band segment being continuous or quasi-continuous along at least a
portion of its length.
2. The touch sensor of claim 1, wherein a resistance ratio defined by the
combined resistance of the band segments over the resistance of the touch region is
greater than 0.05.
- 15 3. The touch sensor of claim 1, wherein the at least one band segment
has a width that varies along its length.
4. The touch sensor of claim 1, wherein the at least one band segment
has a thickness that varies along its length.
5. The touch sensor of claim 1, wherein the at least one band segment
20 comprises an array of electrically conductive elements, the conductive elements
having a spacing or size that varies along the length of the at least one band
segment.
6. The touch sensor of claim 1, wherein each band segment is continuous
or quasi-continuous along its entire length.

7. A dynamic touch sensor system, comprising:

a touch sensor that generates touch information in response to a touch and generates measurable information indicative of a given electrical characteristic in the touch sensor, the touch sensor comprising a substrate having a resistive touch region, a set of electrodes electrically coupled to the touch region, and a band framing the touch region and having a resistivity intermediate the resistivity of the electrodes and the resistivity of the touch region, wherein the band has a substantially non-uniform linear resistance, the band being continuous or quasi-continuous along at least a portion of its length; and

control electronics coupled to the electrodes for receiving the touch information and measurable information from the touch sensor, wherein the control electronics uses an algorithm to determine the coordinates of the location of the touch in the touch region based on the touch information, and modifies the algorithm based on the measurable information.

8. The touch sensor system of claim 7, wherein the algorithm is a mapping algorithm.

9. The touch sensor system of claim 7, wherein a resistance ratio defined by the resistance of the band over the resistance of the touch region is greater than 0.05.

10. The touch sensor system of claim 7, wherein the band has a width that varies along its length.

11. The touch sensor system of claim 7, wherein the band has a thickness that varies along its length.

12. The touch sensor system of claim 7, wherein the band comprises an array of electrically conductive elements disposed on the substrate, the conductive elements having a spacing or size that varies along the length of the band.

13. The touch sensor system of claim 7, wherein the band is continuous or
5 quasi-continuous along its entire length.

14. The touch sensor system of claim 7, wherein the band comprises a plurality of band segments, wherein the electrodes are disposed between the band segments, and at least one of the band segments has a linear resistance that varies along its length.

10 15. A touch sensor, comprising:
a substrate having a resistive touch region;
a set of electrodes electrically coupled to the touch region; and
a plurality of band segments framing the touch region and having a resistivity intermediate between the resistivity of the electrodes and the resistivity of the touch
15 region, wherein the electrodes are disposed between the band segments, and at least one band segment comprises a continuous resistive background material and an array of electrically conductive elements disposed substantially perpendicularly along at least a lengthwise band portion of the at least one band segment in contact with the background material, the electrically conductive elements having a resistivity
20 that is lower than the resistivity of the background material, the lengthwise band portion being quasi-continuous along its length.

16. The touch sensor of claim 15, wherein the resistive touch region is formed from the background material.

17. The touch sensor of claim 15, wherein the background material has a
25 resistivity different from the resistivity of the touch region.

18. The touch sensor of claim 15, wherein the electrically conductive elements extend perpendicularly relative to the lengthwise band portion.

19. The touch sensor of claim 15, wherein the electrically conductive elements are generally arranged parallel to each other.

5 20. The touch sensor of claim 15, wherein the electrically conductive elements are composed of linear lines.

21. The touch sensor of claim 15, wherein the background material comprises a series of resistive segments alternately disposed between the conductive elements.

10 22. The touch sensor of claim 21, wherein each electrically conductive element has a fractional width defined by the dimension of the electrically conductive element along the lengthwise band portion over the sum of the dimension of the corresponding resistive segment along the lengthwise band portion and the dimension of the electrically conductive element along the lengthwise band portion.

15 23. The touch sensor of claim 22, wherein the fractional width is less than 0.9.

24. The touch sensor of claim 22, wherein the fractional width is between 0.2 and 0.8.

20 25. The touch sensor of claim 22, wherein the fractional width amongst the electrically conductive elements varies.

26. The touch sensor of claim 22, wherein the fractional width amongst the electrically conductive elements is uniform.

25 27. The touch sensor of claim 21, wherein the dimension of each of the resistive segments along the lengthwise band portion is less than 1 percent of the length of the at least one band segment.

28. The touch sensor of claim 15, wherein the continuous resistive background material and the array of electrically conductive elements are disposed along the entire length of the at least one band segment.

29. The touch sensor of claim 15, wherein the at least one band segment
5 comprises the plurality of band segments.

30. A touch sensor, comprising:
a substrate having a resistive touch region with a non-rectangular geometry;
a set of electrodes electrically coupled to the touch region to generate non-linear voltage gradients over the touch region; and
10 a resistive band framing the touch region and having a resistivity intermediate the resistivity of the electrodes and the resistivity of the touch region, the resistive band being continuous or quasi-continuous along at least a portion of its length.

31. The touch sensor of claim 30, wherein the non-rectangular geometry is a triangular geometry.

15 32. The touch sensor of claim 30, wherein the non-rectangular geometry is a hexagonal geometry.

33. The touch sensor of claim 30, wherein the non-rectangular geometry has a curved periphery.

34. The touch sensor of claim 30, wherein the non-rectangular geometry is
20 non-planar.

35. The touch sensor of claim 30, wherein the band has a substantially uniform linear resistance.

36. The touch sensor of claim 30, wherein the band has a substantially non-uniform linear resistance.

37. The touch sensor of claim 30, wherein the band comprises a plurality of band segments, the electrodes are disposed between the band segments, and at least one of the band segments has a linear resistance that varies along its length.

38. The touch sensor of claim 30, wherein the band comprises band
5 segments between the electrodes.